

Notice of Allowability

Application No.

09/621,795

Examiner

Ted Kim

Applicant(s)

MILLER ET AL.

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 09/23/2004.
2. ☒ The allowed claim(s) is/are 31-33,35,37,38,40-42,51-54,56, 57, 59-61,76-78 and 83-86.
3. ☒ The drawings filed on 08 April 2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Robert McLaughlin on 11/18/04.

The application has been amended as follows:

SPECIFICATION

The first paragraph of the specification has been replaced as follows:

--This application claims the benefit of U.S. Patent Application No. 08/906,731 filed on August 5, 1997, now U.S. Patent 6,112,512, entitled "Method and Apparatus of Pulsed Injection for Improved Nozzle Flow Control." Additionally, this application claims priority to and repeats a substantial portion of prior application entitled "Method and Apparatus of Pulsed Injection for Improved Nozzle Flow Control" filed on August 5, 1997 which was accorded serial number 08/906,731. Since this application names the inventor named in the prior application, the application constitutes a continuation in part of the prior application. This application incorporates by reference prior U.S. Patent Application No. 08/906,731 filed on August 5, 1997, now U.S. Patent 6,112,512, entitled "Method and Apparatus of Pulsed Injection for Improved Nozzle Flow Control" and U.S.

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Patent Application No. 08/906,768 filed on August 5, 1997, now U.S. Patent 6,112,513, entitled "Method and Apparatus of Asymmetric Injection at the Subsonic Portion of a Nozzle Flow" which is herein incorporated by reference.—

- On page 14, paragraph 2, "1C" has been replaced by – 1 D –.
- On page 14, paragraph 4, "3C" has been replaced by – 3 E –.

Oath/Declaration

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the pending application (08/906,731) under 35 USC 120 by specifying the application number, day, month and year of its filing.

3. Applicant is now required to submit a substitute declaration or oath to correct the deficiencies set forth above. The substitute oath or declaration must be filed within the THREE MONTH shortened statutory period set for reply in the "Notice of Allowability" (PTO-37). Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136. Failure to timely file the substitute declaration (or oath) will result in **ABANDONMENT** of the application. The transmittal letter accompanying the declaration (or oath) should indicate the date of the "Notice of Allowance" (PTOL-85) and the application number in the upper right hand corner.

CLAIMS

- Claims 44, 46-49, 63, 65-68, 70-74, 79-82 have been canceled.

31. (Currently amended) A system for vectoring a ducted primary flow through a three-dimensional (3D) small area expansion nozzle by varying a shape, cross-sectional area, or orientation of an effective throat or sonic plane within the a ducted primary flow, comprising:

an opening for accepting the primary flow;

at least one primary injector located wherein said at least one injector is inclined to oppose the primary flow up-stream of said effective throat or sonic plane and within a convergent portion of the three-dimensional (3D) small area expansion nozzle;

at least one supplemental injector wherein said at least one supplemental injector is located downstream of the at least one primary injector and within a divergent portion of the 3D small area expansion nozzle, wherein said at least one supplemental injector is inclined to oppose the primary flow, and wherein the at least one primary and supplemental injectors are arranged three-dimensionally and operable to continuously inject fluidic pulses to provide a flow field opposed to a subsonic portion of the primary flow in order to vector the primary flow, wherein the injection of fluidic pulses within the subsonic portion of the primary flow is operable to prevent shock formation; and

at least one controller operable to direct said at least one primary and supplemental injector to provide a flow operable to dynamically vary the shape, cross-sectional area, or orientation of the effective throat or sonic plane.

51. (Currently amended) A system for vectoring a primary flow comprising:

a nozzle having an inner surface and a physical throat, wherein the physical throat comprises a region within the nozzle of lowest cross-sectional area, the physical throat being situated in a path of the primary flow of fluid;

a plurality of primary and secondary injectors arranged three-dimensionally along the inner surface of the nozzle, the plurality of injectors arranged to oppose the primary flow of fluid in a first intended vectoring plane, and wherein said primary injectors are

operable to continuously inject fluidic pulses to dynamically vary the shape, cross-sectional area, or orientation of an effective throat or sonic plane within said nozzle; and
at least one controller operable to direct said ~~at least one~~ plurality of primary and supplemental injectors to provide a dynamic flow operable to dynamically vary the shape, cross-sectional area, or orientation of the effective throat or sonic plane.

78. (Currently amended) A system for vectoring a primary flow in three dimensions by varying an effective throat or sonic plane within a ducted primary flow, comprising:

- a convergent portion of a nozzle operable to accept the primary flow;
- at least one primary injector located wherein said at least one injector is inclined to oppose the primary flow up-stream of said effective throat or sonic plane;
- at least one supplemental injector and wherein said at least one supplemental injector is located downstream of the at least one primary injector, wherein said at least one supplemental injector opposes the primary flow in the intended vectoring plane, wherein said injector opposes the primary flow and wherein the at least one primary and supplemental injectors are arranged three-dimensionally to provide a flow field comprising fluidic pulses and opposed to a subsonic portion of the primary flow in order to vector the primary flow; and
- at least one controller operable to direct said at least one primary and supplemental injector operable to provide a dynamic continuous flow operable to vary the effective throat or sonic plane.

83. (Currently amended) [[1.]] A control system for vectoring a primary flow within a three-dimensional small area expansion ratio nozzle by varying an effective throat of the three-dimensional small area expansion ratio nozzle, comprising:

- an opening for accepting the primary flow;
- a smooth converging portion of the nozzle wherein the primary flow is at a subsonic velocity;

a throat coupling said converging portion to a diverging portion of the three-dimensional nozzle downstream of said throat;

a plurality of primary injectors located proximate to the throat wherein the plurality of primary injectors are inclined to oppose the primary flow;

a plurality of supplemental injectors wherein the a plurality of supplemental injectors are located in the three-dimensional nozzle downstream of the plurality of primary injectors, wherein the plurality of supplemental injectors is are inclined to oppose the primary flow, and wherein the plurality of primary and supplemental injectors are arranged three-dimensionally to inject fluidic pulses to provide a cross flow field opposed to a subsonic portion of the primary flow in order to vary a shape, cross-sectional area, or orientation of an effective throat within the three-dimensional nozzle; and

at least one controller operable to direct said plurality of primary and supplemental injector to provide a pulsed cross flow operable to vary the effective throat within the three-dimensional nozzle.

84. (Currently amended) A control system for vectoring an exhaust flow within a three-dimensional small area expansion ratio nozzle of a jet engine by varying an effective throat of the three-dimensional small area expansion ratio nozzle, comprising:

an opening for accepting the primary flow;

a smooth converging portion of the nozzle wherein the primary flow is at a subsonic velocity;

a throat coupling said converging portion to a diverging portion of the three-dimensional nozzle downstream of said throat;

a plurality of primary injectors located proximate to the throat wherein the plurality of primary injectors are inclined to oppose the primary flow;

a plurality of supplemental injectors wherein the a plurality of supplemental injectors are located in the three-dimensional nozzle downstream of the plurality of primary injectors, wherein the plurality of supplemental injectors ~~is~~ are inclined to oppose the primary flow, and wherein the plurality of primary and supplemental injectors are arranged three-dimensionally to provide a cross flow field opposed to a subsonic portion of the primary flow in order to vary an effective throat within the three-dimensional nozzle; and

at least one controller operable to direct said plurality of primary and supplemental injector to provide a pulsed cross flow operable to vary the effective throat within the three-dimensional nozzle.

REASONS FOR ALLOWANCE

4. The following is an examiner's statement of reasons for allowance: the prior art of record do not fairly teach in permissible combination the claimed invention. In particular, it is noted that the 3-D arrangement of the primary and/or supplemental injectors in combination with the previous limitations distinguish the claims from the art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 703-308-2631 until approximately November 22 at which point the telephone number will be 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 703-872-9306 for Regular faxes and 703-872-9306 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler, can be reached on 703-306-2772.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>

 Ted Kim	Telephone	703-308-2631
Primary Examiner	(eff. 11/22/2004)	571-272-4829
	Fax (Regular)	703-872-9306
November 22, 2004	Fax (After Final)	703-872-9306
Technology Center 3700 Receptionist	Telephone	703-308-0861
Patents Assistance Center	Telephone	800-786-9199